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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/996,337	11/28/2001	Pary Baluswamy	4307.1US (99-1193.1)	6253

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EXAMINER

PIZARRO CRESPO, MARCOS D

ART UNIT	PAPER NUMBER
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2814

DATE MAILED: 08/26/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/996,337

Applicant(s)

BALUSWAMY ET AL.

Examiner

Marcos D. Pizarro-Crespo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 30 June 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 13.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

Attorney's Docket Number: 4307.1US (99-1193.1)

Filing Date: 11/28/2001

Claimed Priority Date: 8/30/2000 (Divisional 09/651,790)

Applicant(s): Baluswamy et al.

Examiner: Marcos D. Pizarro-Crespo

### **DETAILED ACTION**

This Office action responds to the amendment in paper no. 16 filed on 6/30/2003.

#### ***Acknowledgment***

1. The amendment in paper no. 16, filed on 6/30/2003, in response to the Office action in paper no. 12, mailed on 3/24/2003, has been entered. The present Office action is made with all the suggested amendments being fully considered. Accordingly, pending in this Office action are claims 1-15.

#### ***Drawings***

2. The drawings were received on 6/30/2003 and were filed as paper no. 15. These drawings are accepted.

#### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

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only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 3, 5-9, and 11-15 are rejected under 35 U.S.C. 102(e) as being anticipated by Kepler (US 6037671).
5. Regarding claim 1, Kepler shows (see, e.g., figs. 3 and 4) all aspects of the instant invention including an overlay target comprising: a material surface **21a**; and at least one trench **23** in the material surface **21a**, said trench **23** having a bottom surface and including a series of vertically extending laterally continuous raised lines **23b** originating at the bottom surface of the trench **23**, wherein each of the raised lines **23b** has a surface which is substantially coplanar with the material surface **21a**.
6. Regarding claim 3, Kepler also shows (see, e.g., fig. 4) the overlay target comprising a plurality of other trenches **23** defining the overlay target, each of the trenches **23** including a series of substantially vertically extending laterally continuous raised lines **23b** originating at their bottom surface.
7. Regarding claim 5, Kepler shows (see, e.g., fig. 4) an overlay target comprising: a material surface **21a**; and at least one pad area **23** in the material surface, the pad area **23** having a bottom surface and including a series of substantially vertically extending laterally continuous raised lines **23b** originating at the bottom surface of the pad area **23**, wherein each of the raised lines **23b** have a surface which is substantially coplanar with the material surface **21a**.
8. Regarding claim 6, Kepler also shows the overlay target comprising a plurality of other pad areas **23** defining the overlay target, each of the pad areas **23** including a

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series of substantially vertically extending laterally continuous raised lines **23b** originating at their bottom surface.

9. Regarding claim 7, Kepler shows (see, e.g., fig. 4) the overlay target further comprising at least one trench **24** including a series of substantially vertically extending laterally continuous raised lines **24b** originating at its bottom surface.

10. Regarding claim 8, Kepler shows (see, e.g., figs. 3 and 4) a semiconductor wafer comprising: a semiconductor substrate **21** having a material surface **21a**; and an overlay target in the material surface **21a**, said overlay target having a bottom surface comprising at least one series of substantially vertically extending laterally continuous raised lines **23b**, **24b** originating at the bottom surface of the overlay target, wherein each of the raised lines **23b**, **24b** have a surface which is coplanar with the material surface **21a**.

11. Regarding claim 9, Kepler shows that the raised lines **23b**, **24b** are etched into the semiconductor substrate **21** (see, e.g., fig. 4).

12. Regarding claim 11, Kepler shows the series of raised lines **23b** disposed in at least one trench **23**.

13. Regarding claim 12, Kepler shows (see, e.g., fig. 4) a plurality of other trenches **23** and a corresponding plurality of series of substantially vertically extending laterally continuous raised lines **23b** defining the overlay target, wherein each of the trenches **23** includes one of the plurality of series of raised lines **23b**.

14. Regarding claim 13, Kepler also shows (see, e.g., fig. 4) that the series of raised lines **24b** is disposed in at least one pad area **24**.

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15. Regarding claim 14, Kepler shows (see, e.g., fig. 4) a plurality of pad areas **24** and a corresponding plurality of series of substantially vertically extending laterally continuous raised lines **24b** defining the overlay target, wherein each of the pad areas **24** includes one of the plurality or series of raised lines **24b**.

16. Regarding claim 15, Kepler shows (see, e.g., fig. 4) the series of raised lines comprising a first series of raise lines **24b** disposed in a pad area **24** and a second series of raised lines **23b** disposed in a trench **23**.

***Claim Rejections - 35 USC § 103***

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

18. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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19. Claims 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kepler in view of Jang (US 5786260).

20. Regarding claim 2, Kepler shows most aspects of the instant invention (see paragraphs 5-16 above), except for the overlay target also comprising a continuous trench defining the perimeter of a geometric shape. Jang (see, e.g., col.5/ll.41-46), on the other hand, teaches that such a trench will enhance the chemical-mechanical polishing (CMP) of Kepler's overlay target.

It would have been obvious at the time of the invention to one of ordinary skill in the art to provide Kepler's overlay target with a continuous trench defining the perimeter of a geometric shape, as suggested by Jang, to enhance the CMP of the overlay target.

21. Regarding claim 4, Kepler shows most aspects of the instant invention (see paragraphs 5-16 above), except for the plurality of trenches also comprising at least one continuous trench defining the perimeter of a geometric shape. Jang (see, e.g., col.5/ll.41-46), on the other hand, teaches that such a trench will enhance the chemical-mechanical polishing (CMP) of Kepler's overlay target.

It would have been obvious at the time of the invention to one of ordinary skill in the art to provide Kepler's overlay target with a continuous trench defining the perimeter of a geometric shape, as suggested by Jang, to enhance the CMP of the overlay target.

22. Claims 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Deguchi (JP 62-18714) in view of Kinoshita (JP 58-90728).

23. Deguchi shows (see, e.g., fig. 2) all aspects of the instant invention including a semiconductor wafer comprising a semiconductor substrate **10** and an overlay target **28**

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having a bottom surface, said overlay target comprising at least one series of substantially vertically laterally continuous extending raised lines originating at the bottom surface of the overlay target **28**.

Deguchi, however, fails to show a top view of the overlay target showing that the raised lines are also laterally continuous. In spite of this, Deguchi discloses (pp.3/col.1/ll.5-17) that his alignment-mark forming-technique differs from the conventional one in those steps involving a mark material layer, which is eliminated from his method steps. Deguchi (pp.2/col.2-4) further gives Kinoshita, who clearly shows laterally continuous raised lines, as an example of a conventional technique (see, e.g., Kinoshita/fig.1). Since the differences between Deguchi and Kinoshita are the method steps involving the use of the mark material layer, it would have been obvious at the time of the invention to one of ordinary skill in the art that Deguchi's raised lines are also laterally continuous.

24. Regarding claim 10, Deguchi shows that the at least one series of raised lines may be etched into a material layer **27** overlying the semiconductor substrate **10** (see, e.g., abstract and fig. 2).

### ***Response to Arguments***

25. Applicant's arguments with respect to claims 1-7, 9, and 11-15 have been considered but are moot in view of the new ground(s) of rejection.

26. The applicants argue:

The goal of Deguchi of producing a high contrast by reducing the reflectivity in areas 23 dictates against leaving extended portions of unetched surface area such as would be the result of the proposed suggested combination of Deguchi with Kinoshita. Accordingly, the references cited by the examiner cannot be seen as suggesting any combination.



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The examiner responds:

Applicants' arguments cannot take the place of evidence in the record. *In re Schulze*, 346 F.2d 600, 602, 145 USPQ 716, 718 (CCPA 1965). *In re Geisler*, 116 F.3d 1465, 43 USPQ2d 1362 (Fed. Cir. 1997). In the instant case, it is Deguchi himself who teaches that the only difference between his alignment mark and that of Kinoshita is in those method steps related to the use of a mask material layer (see, e.g., Deguchi, pp.3/col.1/ll.5-17 and pp.2/col.2-4). This material layer is eliminated from Deguchi's method steps. Since the differences between Deguchi and Kinoshita are only the method steps related to the use of the mask material layer, it would be obvious that Deguchi's raised lines must also be laterally continuous, as those of Kinoshita (see, e.g., Kinoshita/fig. 1).

### ***Conclusion***

27. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

28. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

29. Papers related to this application may be submitted directly to Art Unit 2814 by facsimile transmission. Papers should be faxed to Art Unit 2814 via the Art Unit 2814 Fax Center located in Crystal Plaza 4, room 3C23. The faxing of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2814 Fax Center number is **(703) 308-7722** or **-7724**. The Art Unit 2814 Fax Center is to be used only for papers related to Art Unit 2814 applications.

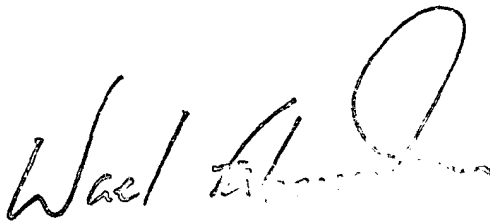
30. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Marcos D. Pizarro-Crespo** at **(703) 308-6558** and between the hours of 9:30 AM to 8:00 PM (Eastern Standard Time) Monday through Thursday or by e-mail via [Marcos.Pizarro@uspto.gov](mailto:Marcos.Pizarro@uspto.gov). If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy, can be reached on (703) 308-4918.

31. Any inquiry of a general nature or relating to the status of this application should be directed to the **Group 2800 Receptionist** at **(703) 308-0956**.

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32. The following list is the Examiner's field of search for the present Office Action:

Field of Search	Date
U.S. Class / Subclass(es): 257/797; 438/401,462,975	8/22/2003
Other Documentation: PLUS Analysis	6/5/2000
Electronic Database(s): EAST (USPAT, EPO, JPO)	8/22/2003

  
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